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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MRUK, GEOFFREY S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/822,956

Applicant(s)

HOWARD, PETER GUY

Examiner

Geoffrey Mruk

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10, 11, 14-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato (US 5,594,480).

With respect to claim 10, Sato discloses a printhead (Fig. 1), comprising:

- a laser system (Fig. 2, element 34) operative to emit laser energy (Column 8, lines 26-36); and
- a page-wide array (Fig. 9, elements 21 and 81) comprising a plurality of areas (Fig. 1, elements 14 and 17 for each color - CMY), wherein each area includes
- a heating layer (Fig. 2, element 31) including an electric heating layer (Fig. 2, element 31a and 31b) and a photon absorbing layer (Column 8, lines 19-28, i.e. second heating member), each heating layer of a particular area overlaps the heating layer of an adjacent area and
- a plurality of nozzle systems (Fig. 1, elements 17-19), wherein each nozzle system includes:
 - an orifice (Fig. 2, element 23),
 - a fluid chamber (Fig. 2, element 20) including a fluid (Column 6, lines 51-61), and
 - the photon absorbing layer (Column 8, lines 19-28, i.e. second heating member),

- wherein a portion of the electric heating layer is adjacent the fluid chamber and is operative to heat the fluid in the fluid chamber to a lower threshold temperature (Column 9, lines 1-8), and
- the photon absorbing layer is adjacent the fluid chamber and is operative to absorb laser energy emitted from the laser and heat the fluid in the fluid chamber from the lower threshold temperature to an upper threshold temperature (Column 9, lines 8-22).

With respect to claim 11, Sato discloses a fluid ejection system (Fig. 9) is operative to control the activation of the electric heating layers (Column 12, lines 19-22) in a sequential manner (Column 12, lines 30-41) from the first end of the page-wide array to the second end of the page-wide array, wherein the fluid ejection system is operative to control the scan rate of the laser system from the first end of the page-wide array (Fig. 9, element 89a) to the second end of the page-wide array (Fig. 9, element 89d), wherein the page-wide array printing system synchronizes the activation of the electric heating layers and the scan rate of the laser system from the first end to the second end so that the fluid in the fluid chamber of a selected nozzle system is heated to the lower threshold temperature (Column 9, lines 1-8) using the electric heating layer prior to the laser emitting laser energy directed to the photon absorbing layer of the selected nozzle systems (Column 9, lines 8-22).

With respect to claim 14, Sato discloses the electric heating layer includes a resistive layer (Column 7, lines 66-67).

With respect to claim 15, Sato discloses a printhead (Fig. 1) comprising:

- a fluid chamber (Fig. 9, element 20);
- a nozzle (Fig. 9, element 23) in fluid communication with the fluid chamber to allow the fluid to be ejected from the fluid chamber;
- means (Fig. 9, element 31), responsive to an electric current (Column 8, line 2) for heating the fluid in the fluid chamber to a first threshold (Column 9, lines 8-11); and
- means (Fig. 2, element 34), responsive to optical energy (Column 8, lines 19-28, i.e. second heating member), for heating the fluid in the fluid chamber to a second threshold sufficient to eject ink from the fluid chamber (Column 9, lines 8-22).

With respect to claim 16, Sato discloses a plurality of fluid chambers and a plurality of nozzles associated with each fluid chamber (Fig. 1, each color - CMY), wherein the means responsive to the electric current heats the fluid in the plurality of fluid chambers and the means responsive to optical energy is operative to heat fluid at each nozzle (Column 9, lines 8-22).

With respect to claim 17, Sato discloses means for synchronizing the heating of the fluid in the fluid chambers to the lower threshold with the heating of the fluid from the lower threshold to the upper threshold (Column 9, lines 8-22).

With respect to claim 18, Sato discloses means for synchronizing the heating of the fluid in each fluid chamber in a sequential manner using the means responsive to the electric current (Column 9, lines 8-11) with the heating of the fluid in each nozzle using the means responsive to the optical energy (Column 8, lines 11-22).

With respect to claim 19, Sato discloses a printhead (Fig. 1) comprising:

- a plurality of fluid chambers (Fig. 9, element 20 for each color CMY);
- a plurality of nozzles (Fig. 9, element 23), each associated with at least one of the plurality of fluid chambers;
- a plurality of resistors (Fig. 9, element 30), each coupled to receive electric current (Column 9, lines 1-8) and corresponding to one of the plurality of fluid chambers; and
- a plurality photon absorbing layers (Column 8, lines 19-28, i.e. second heating member) that generate heat in response to optical energy, each photon absorbing layer being coupled to the fluid chambers to eject fluid from the fluid chambers (Column 9, lines 8-22).

With respect to claim 20, Sato discloses the photon absorbing layer (Column 8, lines 19-28, i.e. second heating member) includes a plurality of sections each associated with a single nozzle.

With respect to claim 21, Sato discloses a laser system (Fig. 2, element 34) operative to direct laser energy at each of the plurality of photon absorbing layers (Column 9, lines 11-22).

With respect to claim 22, Sato discloses a print control system operative to synchronize the activation of the electric heating layers and the scan rate of the laser system to eject fluid from the fluid chambers (Column 12, lines 30-41).

With respect to claim 23, Sato discloses the plurality of resistors (Fig. 2, element 31) and plurality photon absorbing layers (Column 8, lines 19-28, i.e. second heating member) are substantially coplanar with each other (Fig. 2).

With respect to claim 24, Sato discloses the plurality of resistors and plurality photon absorbing layers each form distinct layers (Column 8, lines 19-28, i.e. second heating member).

With respect to claim 25, Sato discloses the plurality of resistors (Fig. 2, element 29, 31) are each adjacent to one of the plurality of fluid chambers (Fig. 2, element 20) and wherein the plurality of photon absorbing layers (Column 8, lines 19-28, i.e. second heating member) are separated from the fluid ejection chambers by the plurality of resistors (Fig. 2, elements 14 and 17).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US 5,594,480) in view of Saito (US 6,068,363).

With respect to claims 12 and 13, Sato discloses the page-wide array (Fig. 9, elements 21, 81) and the fluid (Column 6, lines 51-61).

However, Sato fails to disclose the page-wide array includes about 2000 to 8000 nozzle systems and the fluid includes black ink.

Saito discloses a recording head where "in the case of using a line head comprised of nozzles arrayed the full width of A4 size recording paper as the head 30, approximately 3,000 or more become necessary" (Column 2, lines 27-30) and "black ink" (Column 12, line 9).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the teachings of Saito for the device disclosed by Sato. The motivation for doing so would have been "Consequently higher image quality, prevention of density irregularities, and improvement of operation reliability can be achieved as compared to using known line heads" (Column 3, lines 45-48).

Response to Arguments

Applicant's arguments, see page 7, lines 7-14, filed 27 July 2006, with respect to claims 10, 11, and 14-25 have been fully considered and are persuasive. The rejection of claims 10, 11, and 14-25 has been withdrawn.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey Mruk whose telephone number is 571 272-2810. The examiner can normally be reached on 7am - 330pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GSM
10/5/2006

GM


STEPHEN MEIER
SUPERVISORY PATENT EXAMINER